

**CITY OF BREMERTON
DEPARTMENT OF PUBLIC WORKS
AND UTILITIES
COMBINED SEWER OVERFLOW
ANNUAL REPORT FOR 2021**

NPDES PERMIT #WA-002928-9

SUBMITTED TO WASHINGTON DEPARTMENT OF ECOLOGY

May 30, 2022

TABLE OF CONTENTS

| | |
|--|----|
| EXECUTIVE SUMMARY | 1 |
| 1) INTRODUCTION | 3 |
| 2) CSO WATER QUALITY IMPACT MODEL..... | 5 |
| 3) CSO EVENTS | 6 |
| 4) BASELINE REVIEW AND UPDATE | 6 |
| 5) CSO FLOW MONITORING | 8 |
| 6) REQUIREMENTS FOR CONTROLLING CSOS | 10 |
| 7) CSO COMPLIANCE SCHEDULE | 10 |
| 8) CSO ACTIVITIES IN 2021 | 12 |
| 9) CSO PROGRAM COST TO REDUCTION COMPARISON..... | 13 |
| 10) WASTEWATER SYSTEM UPGRADES AND IMPROVEMENTS..... | 13 |
| 11) UPDATE OF WASTEWATER COMPREHENSIVE PLAN..... | 13 |
| 12) CMOM PROGRAM..... | 14 |
| 13) ENVVEST | 14 |
| 14) FUNDING | 15 |
| 15) COMPLIANCE WITH NINE MINIMUM CONTROLS | 15 |
| PROPER OPERATION AND MAINTENANCE | 15 |
| MAXIMIZATION OF COLLECTION SYSTEM STORAGE | 16 |
| REVIEW OF PRETREATMENT REQUIREMENTS..... | 16 |
| MAXIMIZATION OF FLOW TO THE WWTP | 16 |
| ELIMINATION OF DRY WEATHER CSOs..... | 16 |
| FLOATABLE CONTROL..... | 16 |
| POLLUTION PREVENTION PROGRAMS | 16 |
| PUBLIC NOTIFICATION..... | 17 |
| MONITORING TO CHARACTERIZE CSO IMPACTS | 17 |
| 16) CSO/WW SYSTEM UPGRADES PLANNED FOR 2022 | 17 |
| 17) EASTSIDE PLANT YEARLY AVERAGES | 18 |
| 18) REFERENCES | 18 |
| 19) CERTIFICATION | 19 |

EXECUTIVE SUMMARY

In 2021, the City of Bremerton (City) continued to improve and update its wastewater collection system. All of the Combined Sewer Overflow (CSO) projects were completed by the end of 2009. The **16-year, \$50+ million-dollar CSO Reduction Program** achieved greater than 99% reduction in the frequency and volume of CSOs. Bremerton joins only three other Washington State communities in celebrating completion of all its planned CSO Reduction projects.

This milestone was achieved by completing all stormwater separation, sanitary sewer system upgrades, operational changes, and private property stormwater separation projects identified in the CSO Reduction Plans.

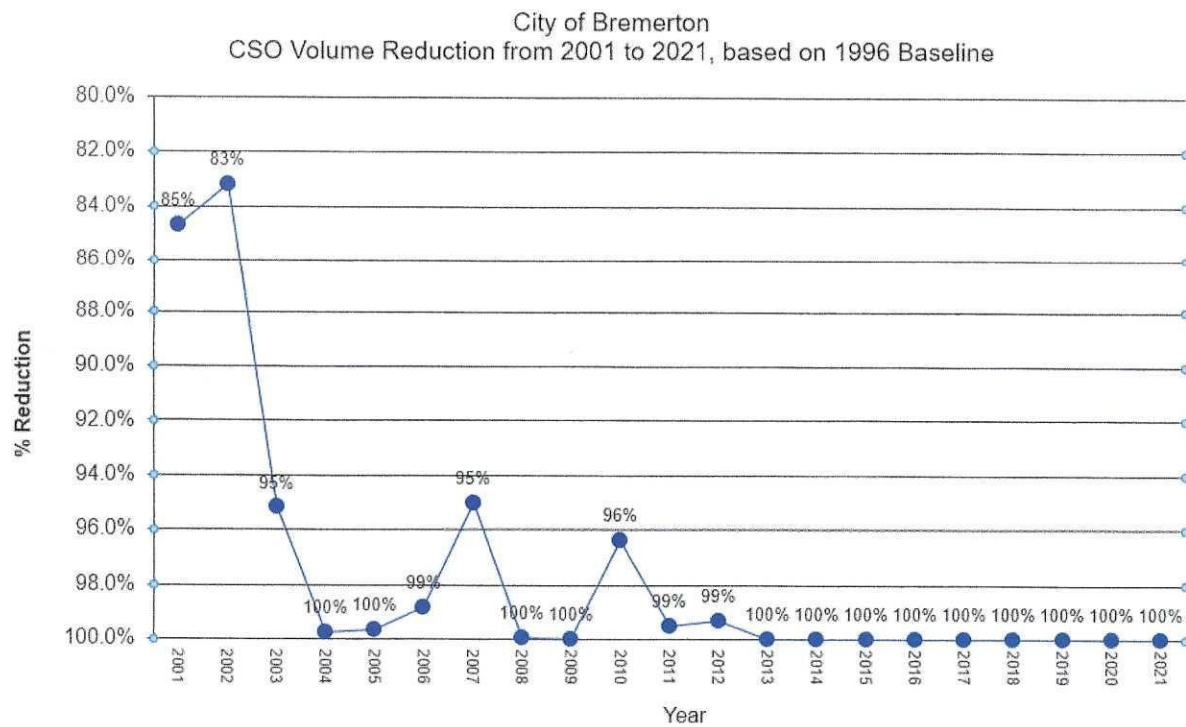
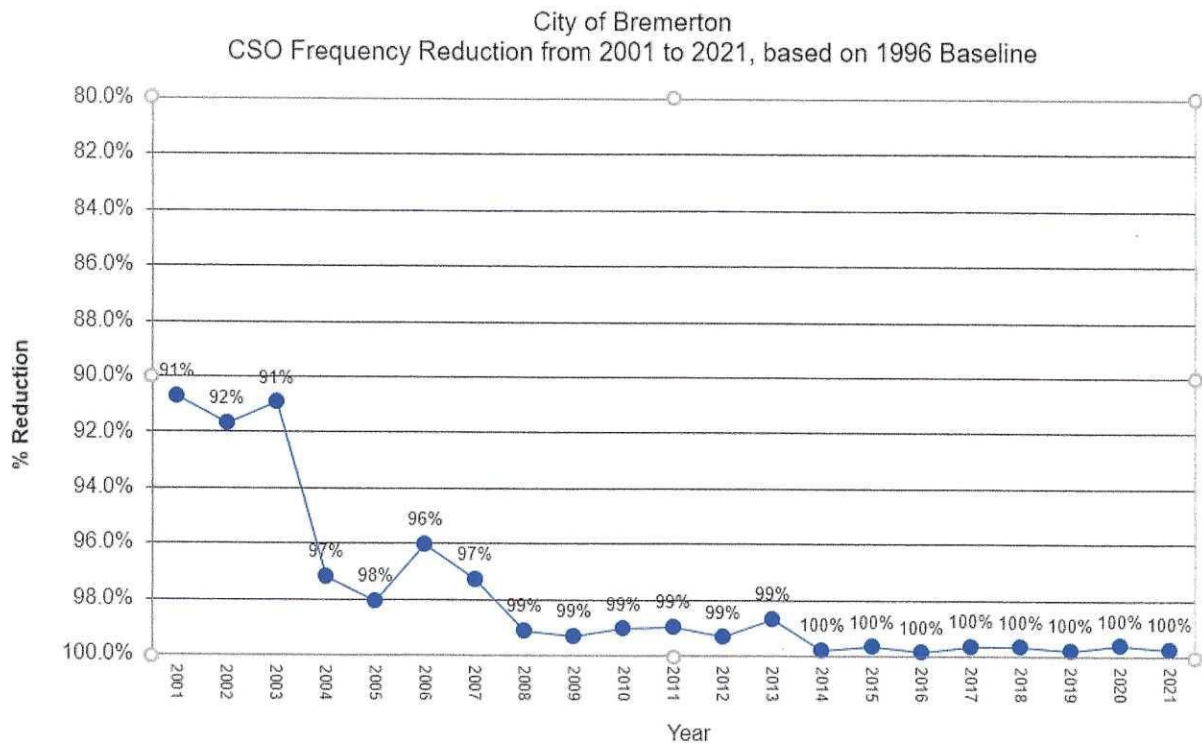
Chapter 173-245-090 of the Washington Administrative Code (WAC) requires submittal of an annual CSO report by May 31. The following information is included in this Annual CSO Report:

- CSO Event, Duration, Volume, Precipitation, Storm Duration
- CSO Event Volume and Frequency monitored in 2021
- Summary of CSO Reduction projects completed to meet federal and state requirements
- Eastside Plant yearly averages of TSS removal efficiency and effluent settleable solids

In 2021 the City of Bremerton:

- Is in compliance with CSO reduction requirements at all 15 sites
- Reduced overflow volume by greater than 99%
- Reduced frequency of events by greater than 99%
- Continued its public education and assistance program to involve citizens of Bremerton with CSO Reduction and provided education on water pollution prevention

The following charts illustrate the percent reduction of frequency and overflow volume as a result of CSO improvements by comparing the baseline frequency and volume with recorded CSO data. CSO frequency and volume baselines were calculated in 1996 using several years of monthly CSO data as measured at each CSO site. Baselines are used to monitor the progress and effectiveness of Bremerton's CSO reduction program. Percent reduction from baseline is calculated by comparing the CSO frequency and volume baselines with 2021's annual CSO event count and volume measured for all events.



1) Introduction

In 2021, the City of Bremerton continued to improve and update its wastewater collection system. All CSO projects were completed by the end of 2009. The **19-year, \$50+ million-dollar CSO Reduction Program** achieved greater than 99% reduction in the frequency and volume of CSOs. Compliance with Chapter 173-245 WAC has been accomplished for all CSO sites.

This was achieved by completing all stormwater separation, sanitary sewer system upgrades, operational changes, and private property stormwater separation projects identified in the CSO Reduction Plans.

WAC 173-245-090 requires submittal of an annual CSO report by May 31 of the following year. The following information is included in this Annual CSO Report:

- CSO Event, Duration, Volume, Precipitation, Storm Duration
- CSO event volume and frequency monitored in 2021
- Summary of CSO Reduction projects completed to meet federal and state requirements
- Eastside Plant yearly averages of TSS removal efficiency and effluent settleable solids

In 2021, the City of Bremerton's wastewater collection system contained 15¹ CSO sites. These structures are in the older portion of the City's wastewater collection system and some pre-date the first wastewater treatment plant built in 1946. CSO site locations are shown in **Figure 1**. All sites have outfall numbers assigned in the City's wastewater treatment plant (WWTP) National Pollutant Discharge Elimination System (NPDES) permit.

Although the City has continually improved the wastewater collection system, a focus on CSO reduction planning began in 1989 in response to Department of Ecology (Ecology) regulations to limit CSOs into state waters. Ecology approved Bremerton's first CSO Reduction Plan in November 1992. A CSO Plan Update was completed in 2000 detailing recommended improvements for the City's wastewater collection system to reduce CSOs implemented through 2009. Ranking of improvement projects considered public health, cost effectiveness, safety concerns, overflow frequency, and infrastructure conditions. All proposed CSO reduction projects are identified in the City's CSO Reduction Plan Update and associated facility plans for wastewater collection system drainage basins.

Ecology issued an Order on Consent to the City in 1993 formalizing the schedule set forth in the City's CSO Reduction Plan. Also in 1993, the City settled a citizen's lawsuit with the Puget Soundkeeper Alliance (PSA), resulting in an agreement that included additional requirements

¹ OF 12, in Anderson Cove basin, is included as one of the 15 CSO sites but was taken out of service when CW-4 was upgraded in 2020. Ecology is waiting for documentation from the City prior removing this outfall from the CSO site list.

such as CSO water quality monitoring and an accelerated construction schedule. CSO baselines and the implementation schedule were modified in an amended order in 2000.

On February 17, 2011 Ecology determined that all projects listed in the “Order on Consent” were completed and the agreement was terminated. On April 26th, 2011 the Puget Soundkeeper Alliance (PSA) released the City from the “Consent Decree,” and on May 11, 2011, the US District Court terminated the “Consent Decree” as requested by the City and PSA.

On June 29th, 2011 the City and PSA celebrated the end of the very successful CSO Reduction Program by inviting the public, local officials, program participants, and elected officials to a summary presentation of the program’s accomplishments. The celebration was well attended and received by all. **Figure 1** and the following table show the location, water body and coordinates for each of the 15 CSO site.

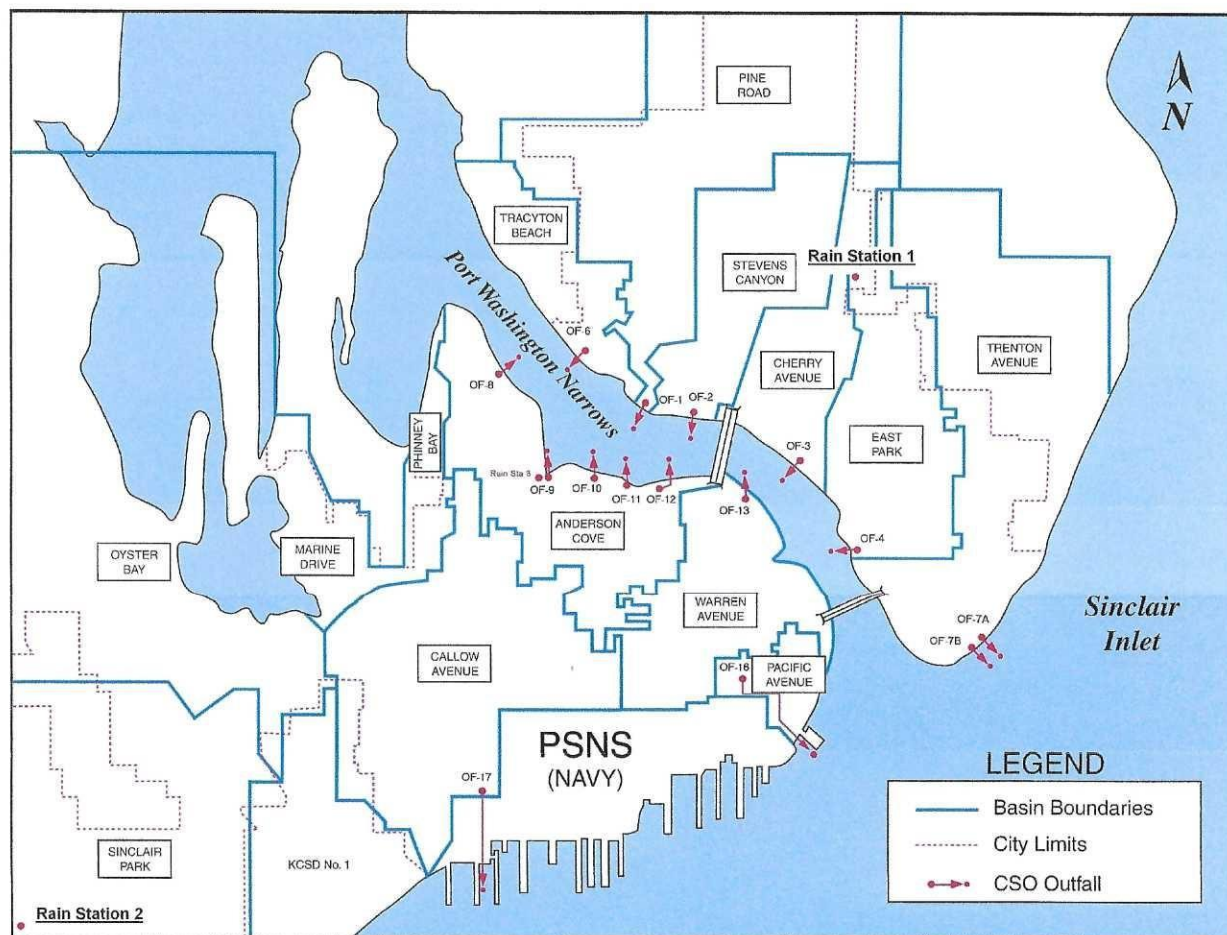


Figure 1 – City of Bremerton CSO Location Site Map

| LIST OF CITY OF BREMERTON CSO OUTFALLS PER SECTION S.9 OF NPDES PERMIT NO. WA0029289 | | | |
|--|----------------------|----------------------------|-------------------------|
| OUTFALL NUMBER | BASIN | LOCATION | RECEIVING WATER |
| OF-1 | Pine Road Basin | 47.581490° -122.636958° | Port Washington Narrows |
| OF-2 | Stevens Canyon Basin | 47.580579° -122.635489° | Port Washington Narrows |
| OF-3 | Cherry Avenue Basin | 47.578031° -122.625189° | Port Washington Narrows |
| OF-4 | Eastpark Basin | 47.571662° -122.619867° | Port Washington Narrows |
| OF-6 | Tracyton Beach Basin | 47.585558° -122.646475° | Port Washington Narrows |
| OF-7A | Trenton Avenue Basin | 47.568998° -122.606821° | Port Washington Narrows |
| OF-7B | Trenton Avenue Basin | 47.568998° -122.606821° | Port Washington Narrows |
| OF-8 | Anderson Cove Basin | 47.584747° -122.650852° | Port Washington Narrows |
| OF-9 | Anderson Cove Basin | 47.580463° -122.645788° | Port Washington Narrows |
| OF-10 | Anderson Cove Basin | 47.578889° -122.640556° | Port Washington Narrows |
| OF-11 | Anderson Cove Basin | 47.578889° -122.639444° | Port Washington Narrows |
| OF-12 | Anderson Cove Basin | 47.578611° -122.636389° | Port Washington Narrows |
| OF-13 | Warren Avenue Basin | 47.578205° -122.630167° | Port Washington Narrows |
| OF-16 | Pacific Avenue Basin | 47.561667° -122.625278° | Sinclair Inlet |
| OF-17 | Callow Avenue Basin | 47.554167° -122.651111° | Sinclair Inlet |

2) CSO Water Quality Impact Model

A CSO/Fecal fate and transport water quality model was developed by the US Navy and USGS as part of the US Navy's ENVVEST Program. The calibrated model indicates Bremerton's CSOs have no measurable effect on bacterial quality of the receiving waters in Sinclair and Dyes Inlets. The model provided the Washington State Department of Health with enough information to re-open shellfish beds in Dyes Inlet in 2003 for the first time since they were closed in the late 1960's.

3) CSO Events

There was a total of three CSO events in 2021, as summarized in the following table:

| Event Date | Outfall | Duration (hrs.) | Volume (gallons) |
|--------------------|---------|-----------------|------------------|
| January 12, 2021 | OF-9 | 0.75 | 32,527 |
| January 13, 2021 | OF-17 | 0.25 | 1,934 |
| September 18, 2021 | OF-17 | 0.1 | 176 |
| TOTAL | | | 34,637 |

The following table shows a summary of CSO events at all locations in 2021.

| 2021 | AVG. Precip | OVERFLOW VOLUME IS SHOWN IN GALLONS | | | | | | | | | | | | | | | Total |
|-----------|----------------|-------------------------------------|------|------|------|------|-------|-------|------|--------|-------|-------|-------|-------|-------|-------|--------|
| | | OF-1 | OF-2 | OF-3 | OF-4 | OF-6 | OF-7A | OF-7A | OF-8 | OF-9 | OF-10 | OF-11 | OF-12 | OF-13 | OF-16 | OF-17 | |
| January | 11.62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32,527 | 0 | 0 | 0 | 0 | 0 | 1,934 | 34,461 |
| February | 4.49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| March | 3.51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| April | 0.53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 0.96 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| June | 1.87 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| July | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| August | 0.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| September | 3.58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 176 | 176 |
| October | 6.19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| November | 10.42 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| December | 7.17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL | 50.38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32,527 | 0 | 0 | 0 | 0 | 0 | 2,110 | 34,637 |

4) Baseline Review and Update

CSO baselines provide volume and frequency levels for the system prior to implementing improvements. This allows Ecology to monitor the progress and effectiveness of Bremerton's CSO reduction program as set forth in Chapter 173-245 WAC.

In 1996, Bremerton established CSO baselines for each outfall. CSO frequency and volume baselines were calculated with a linear regression using several years of monthly rainfall and CSO data as measured at each CSO site. From this data, both the mean and upper 95% confidence intervals were established. Baselines are compared to measured overflow volume and frequency in the attachments to this CSO Report. Percent reduction from baseline is calculated by comparing CSO frequency and volume baselines with 2021's annual CSO event count and volume measured for all CSO events.

Figure 2 illustrates the reduction of overflow frequency as a result of combined sewer system improvements by comparing the frequency baseline with recorded cumulative annual CSO data over the past 20 years of the program.

Figure 3 illustrates reduction of overflow volume as a result of combined sewer system improvements by comparing volume baseline with recorded cumulative annual CSO data.

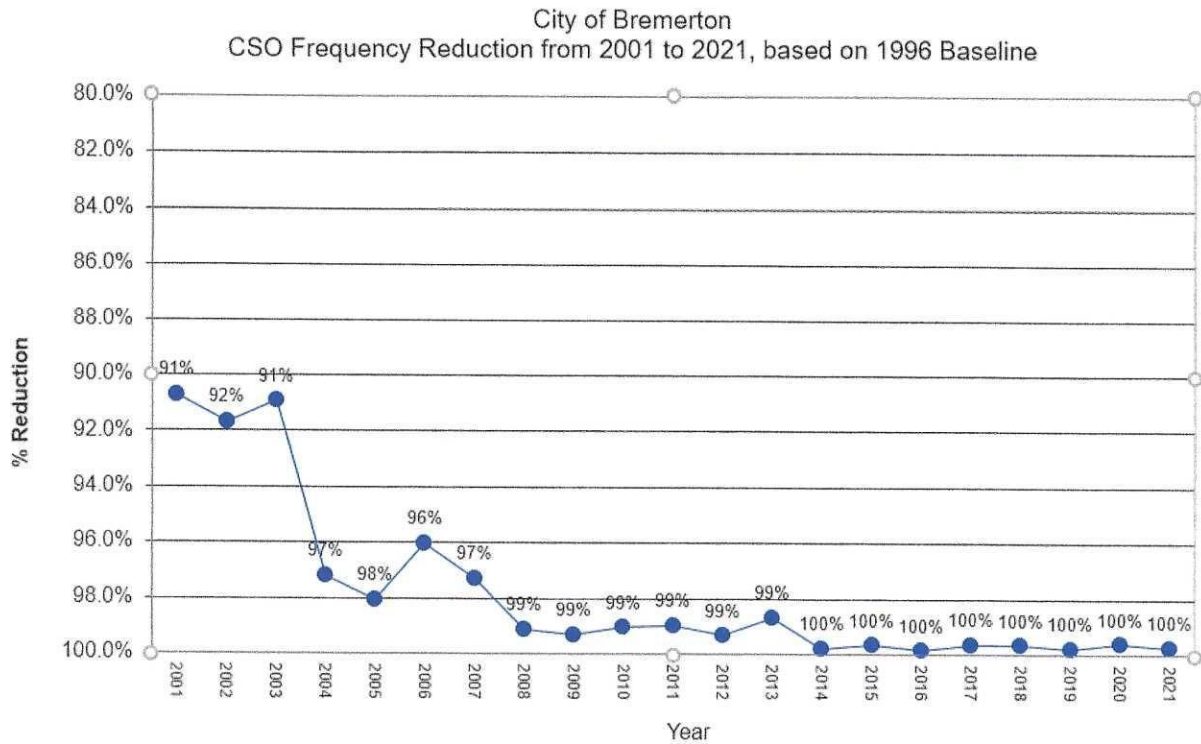


Figure 2 - Percent Reduction of CSO Frequency from Baseline

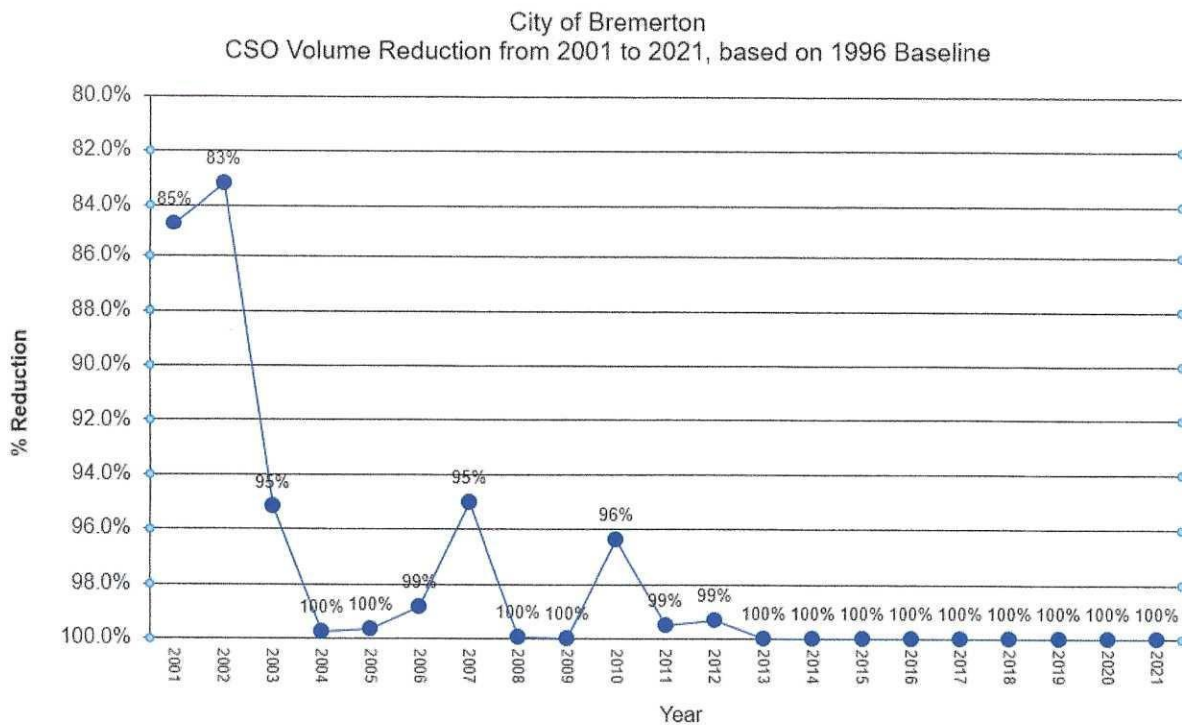


Figure 3 - Percent Reduction of CSO Volume from Baseline

5) CSO Flow Monitoring

Combined sewer overflow sites are continuously monitored with ultrasonic level monitoring equipment and CSOs are recorded as they occur. The overflow sites are connected to the Wastewater Treatment Plant and Supervisory Control Data Acquisition system (WWTP SCADA) so a storm event can be monitored in real-time. This allows an operator or the SCADA system to make adjustments to the wastewater collection system and maximizes the use of storage and pumping/treatment capacity. Continual improvements to the flow monitoring system have made it more reliable and versatile. The City has connected all of the CSO flow meters to the WWTP SCADA system to complete a full integration of functions into one system. CSO flow meters are part of the associated wastewater pump station control system via WWTP SCADA. The operation of each station is monitored by SCADA and will notify an operator as soon as a station goes into an alarm state, such as a “high wetwell”, which will occur prior to a CSO event. If a CSO occurs, the system will again notify an operator and other City staff so that corrective actions can be taken.

Average annual precipitation for 2021 was 54.04 inches as measured by a data logging tipping bucket rain station, located in Central Bremerton. This instrument records the date and time of every 0.01” of rain fall as it occurs.

Figure 4 and **Figure 5** present the CSO volume and frequency relative to precipitation from 2001 to 2021. **Figure 6** presents monthly CSO volume vs. precipitation for 2021 only.

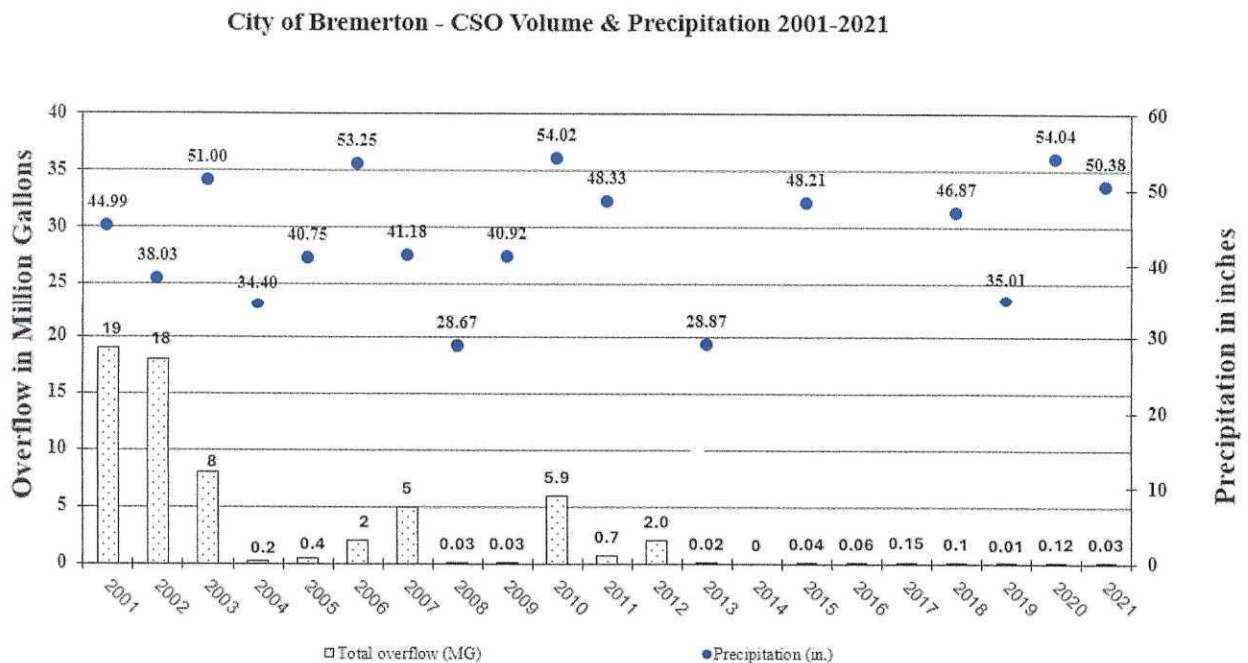


Figure 4 - CSO Volume and Precipitation for 2001-2021

City of Bremerton - CSO Frequency and Precipitation for 2001-2021

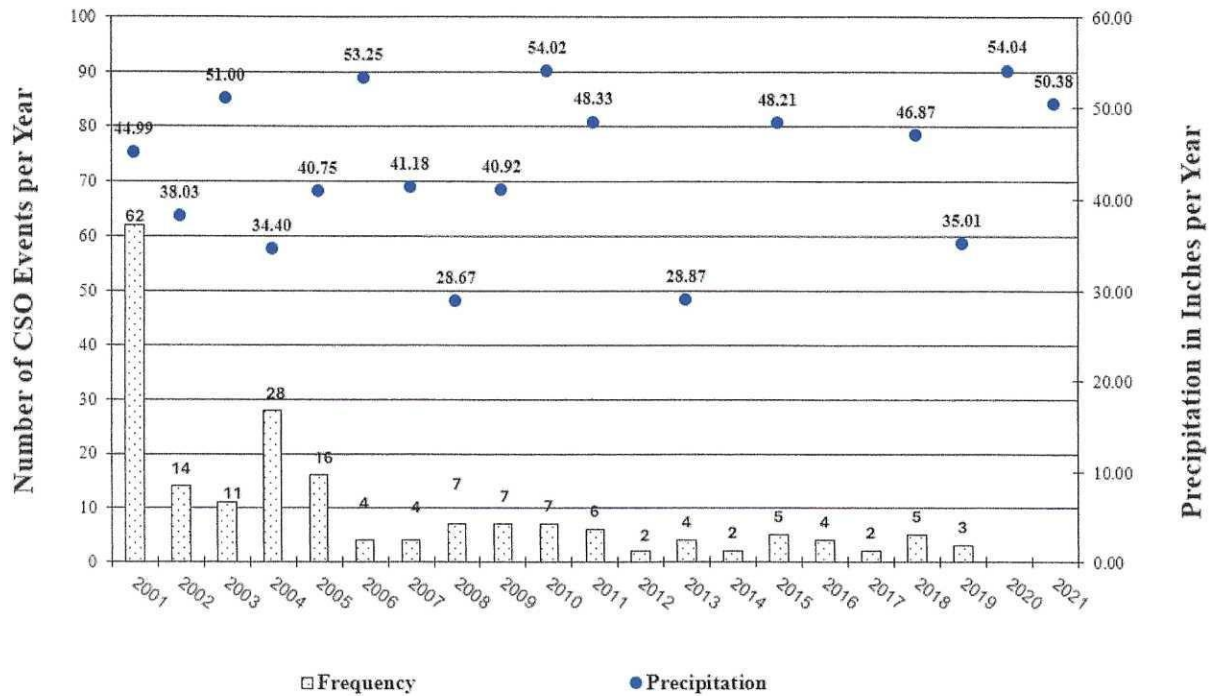


Figure 5 - CSO Frequency and Precipitation for 2001-2021

City of Bremerton
2021 Monthly CSO Volume vs Precipitation

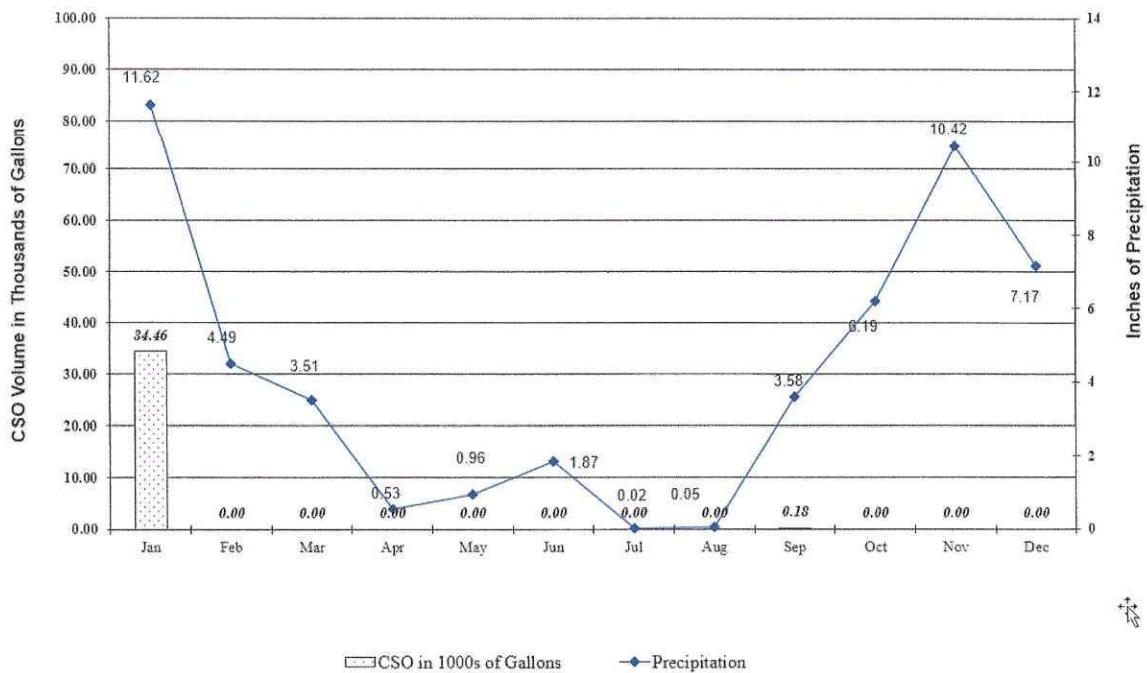


Figure 6 - Monthly Overflow Volume vs. Precipitation for 2021

6) Requirements for Controlling CSOs

Ecology issued Bremerton its National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit, No. WA-0029289, with an effective date of December 1, 2018. Section S9, COMBINED SEWER OVERFLOWS, established reporting and compliance requirements as described in the following table. The list of regulated CSO sites is included as an attachment to this report.

| Paragraph | Description |
|-------------------|---|
| S9.D.a | Based on monitoring data, meet the requirement of “greatest reasonable reduction” as defined in WAC 173-245-020(22). Frequency of overflow events at these CSO outfalls, as a result of precipitation events, must continue to meet the performance standard. |
| S.9.D.b | The performance standard for each controlled CSO outfall is not more than one discharge event per outfall per year on average, due to precipitation. Ecology evaluates compliance with the performance standard annually based on a 20-year moving average. The Permittee must report the running 20-year average number of overflow events per year during this permit term from these CSO outfalls in the CSO Annual Report required in Special Condition S9.C. |
| S.9.D.c, d, and e | Implement a post construction compliance monitoring program, plan, and reporting to demonstrate compliance with water quality standards and protection of designated sites. |

7) CSO Compliance Schedule

All CSO reduction projects have been completed. The following table shows the running 20-year average of overflow events at each site. Only OF 11 exceeds one event per year based on the 20-year running average. The upgrade to pump station CW-4 completed in 2020 will reduce pressure on OF 11 going forward, since flow from that station will now be directed out of Anderson Cove basin during wet weather, reducing flow in that system by approximately 600 gallons per minute.

CSO REDUCTION COMPLIANCE REPORTING TABLE

| CSO Site | Completion yr | | | | | | | | | | | | | | | | | | | | | CSO events 20yr AVG |
|----------|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------------------------------|
| | | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | |
| OF1 | 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0.10 |
| OF2 | 2002 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.05 |
| OF3 | 2005 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 3 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0.50 |
| OF4 | 2003 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.10 |
| OF6 | 2005 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.40 |
| OF7A | 2004 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.10 |
| OF7B | 2004 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 |
| OF8 | 1999 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0.40 |
| OF9 | 2008 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0.55 |
| OF10 | 2008 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0.80 |
| OF11 | 2008 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 3 | 0 | 1 | 0 | 0 | 1.05 |
| OF12 | 1999 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| OF13 | 2002 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0.45 |
| OF16 | 2009 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.30 |
| OF17 | 2003 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0.45 |

Following is a summary of compliance activity at CSO sites

Pine Road Basin

OF 1 was completed in 2000 with the construction of in line storage and separation projects.

Stevens Canyon Basin

OF 2, with separation, in-line storage and the East Side Wet Weather Treatment Facility completion in 2002.

Cherry Avenue Basin

OF 3 is influenced by flows that come from OF7A and 7B and a restriction in the beach main just downstream from the OF site. The Cherry Avenue CSO reduction improvements included replacement of a portion of the gravity pressure main to eliminate a capacity bottleneck, and installation of cleaning access structures on the beach. This construction was completed in 2005.

East Park Basin

OF 4 projects included separation and flow diversions that were completed in 2003. The 18" sewer pipe from Wheaton Way was plugged in 2003, so the only flow currently going through the OF-vault is from 68 apartment units and 2 single family residence properties.

Tracyton Beach Basin

OF 6 CSO reduction improvement for the Tracyton Beach Basin included an upgrade to pump station EB-6. Construction of this project began in 2004 and was completed in February, 2005.

Trenton Avenue Basin

OF 7A and OF 7 B, CSO Reduction was completed in the Trenton Avenue Basin by upgrading two pump stations, replacing a section of the beach forcemain, along with several flow diversions and stormwater separation. All necessary project components required to increase the capacity from this basin were completed in 2004.

Anderson Cove Basin

Upgrades at pump stations CW-1, CW-2, and CW-4 reduced CSOs at **OF 8, OF 9, OF 10, and OF 11**. An upgrade at CW-4 in 2019-20 directed flow out of Anderson Cove basin, further reducing potential CSOs in this basin, particularly at OF 11. OF 12 was taken out of service with the CW-4 upgrade, though formal documentation of this removal is pending.

Warren Avenue Basin

OF 13, the Warren Avenue basin CSO controls included decommissioning of OF 14 and stormwater separation that were constructed in 1996. OF 13 was still affected by high flow rates during storms until the East Side Wet Weather Treatment Facility was constructed and on-line in 2002.

Pacific Avenue Basin

OF 16, the Pacific Avenue basin, separation projects were completed in 2009. OF 15 was abandoned by the US Navy/PSNS in 1999.

Callow Avenue Basin

OF 17 projects were constructed in 5 phases beginning in 1997. The site was in compliance in 2004.

8) CSO Activities in 2021

All required collection system improvements to reduce CSOs were completed by the end of 2009. These projects have reduced and, at some locations, eliminated CSO events. These projects included: installation of new stormwater sewer mains, stormwater separation on private property, increased pumping and treatment capacity, increased wastewater treatment plant capacity, and a wet weather treatment facility. Bremerton is continually making upgrades to its collection and treatment systems, to ensure our ongoing CSO compliance. An important part of the reduction effort has been public relations and outreach to Bremerton's citizens and customers.

9) CSO Program Cost to Reduction Comparison

Figure 7 shows the impact of money spend over time. As funds increased and improvements were completed, CSO volume and frequency decreased.

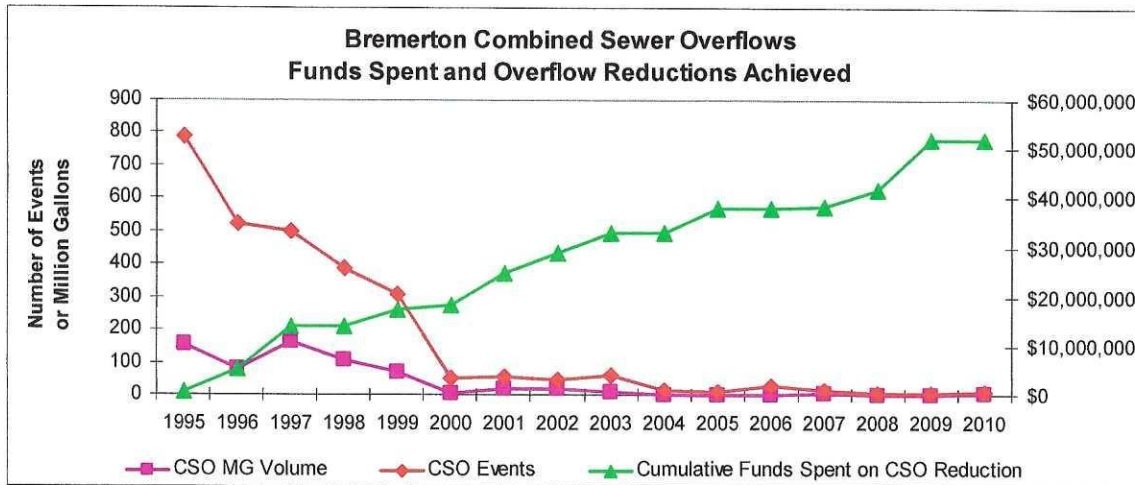


Figure 7 - Cost comparison per million gallons of CSO reduced

Bremerton achieved a 90% reduction in CSO events by 2000 at a cost of \$18 Million. By 2004 a 97% reduction of CSO events was achieved for an additional \$14.7 Million. The remaining \$19.2 Million was spent to reduce the remaining 3% of CSO events to the regulatory limit and to build in extra system capacity to collect and treat storm events greater than the design storm.

10) Wastewater System Upgrades and Improvements

Bremerton is continually making upgrades to its collection and treatment systems to ensure ongoing CSO compliance. In 2021:

- Constructed an upland low pressure sewer system for Oyster Bay along Kitsap Way and Shorewood Drive. This project was funded by an Ecology loan for \$7.7M.
- Performed cure-in-place-pipe (CIPP) of 6,500 lineal feet of sewer mains to prevent infiltration and inflow.
- Replaced 350 feet of old clay pipe sewer along 6th Street to reduce infiltration.
- City staff continues to line sewer laterals using City-owned equipment.

11) Update of Wastewater Comprehensive Plan

Bremerton's Wastewater Comprehensive Plan update was completed and adopted by the Bremerton City Council on December 17, 2016. The Plan was submitted to the Washington

Department of Ecology and approved on November 14, 2016. The Plan ensures existing and future wastewater capacity and plans for wastewater system improvements.

12) CMOM Program

The City of Bremerton is complying with capacity, management, operation, and maintenance (CMOM) requirements for the wastewater collection system. The collection system consists of sanitary sewer laterals, sanitary sewer mains, wastewater pump stations, and the Eastside CSO Treatment Facility.

The City has completed smoke testing in older areas of Bremerton and documented deficiencies on private property and City right-of-way pipelines. Corrective action has included contact with property owners and repair/replacement within the City's area of responsibility.

Sanitary sewer main inspections including smoke testing, hydraulic pressure, and TV camera are regularly completed. Serious deficiencies are corrected as they are found with subsequent actions addressed in the City's Wastewater Comprehensive Plan.

Wastewater pump station improvements have significantly increased the reliability of the conveyance system. Improvements include construction upgrades to existing pump stations, installation of new control systems, dry-pit submersible pumps, emergency power generation systems, and new telemetry hardware and software systems. The City's pumping capacity to the WWTP has increased by 10,000 gpm. The Eastside CSO Treatment Plant (ESTP) activates during high precipitation events. Completed system improvements will help reduce the number of startup events at the ESTP.

13) ENVVEST

The City partnered with the Puget Sound Naval Shipyard and other stakeholders (Suquamish Tribe, Department of Health, Kitsap County Public Works, Kitsap County Health District, EPA, and Department of Ecology) to be part of the Navy's ENVVEST project in Sinclair and Dyes Inlets. Bremerton shared CSO, rainfall, water quality and stream flow data and assisted with the modeling, CSO and stormwater sampling efforts. Following is an excerpt from the Executive Summary of the Technical Master Plan (*November 26, 2001*) detailing the purpose of the agreement:

“The U.S. Navy Puget Sound Naval Shipyard (PSNS), Region X of the U.S. Environmental Protection Agency (EPA), and the Washington State Department of Ecology (Ecology) have entered into an agreement to protect and improve the health of surface waters of Sinclair and Dyes Inlets and surrounding watershed by developing a more environmentally protective strategy for managing pollutant sources in the Inlets than the regulatory framework that is currently in place. This technical work master plan defines the goals, objectives, and technical approach planned for Phase I of the PSNS Project ENVironmental InVESTment (ENVVEST). Based on inputs from regulatory

requirements, stakeholder involvement, community concerns, and available resources, the technical work master plan has been developed to meet the project goals and milestones defined by the ENVVEST Project Management Team.

An approach to develop multiparameter and multimedia TMDLs and assess ecological risk at the watershed scale is being conducted to develop and demonstrate alternative strategies for protecting and improving the ecological integrity of Sinclair and Dyes Inlets. The watershed-based assessment is evaluating environmental problems at the proper scale, providing an integrated framework for cooperative studies with stakeholders and partners, and developing linkages between problems and management options. The studies are providing data to address key issues identified by the working groups, improving the understanding of how the ecosystem functions, and increasing the ability to solve environmental problems. The Technical Working Groups are fostering partnering among stakeholders and establishing the technical and scientific basis to better protect and improve the health of the watershed.”

Project ENVVEST developed a water quality model that defined the impacts of CSOs and other inputs on local water quality in Sinclair and Dyes Inlets. The model shows that potential impact of CSOs to shellfish beds in Dyes Inlet is minimal. **This modeling effort provided the Washington State Department of Health with information needed to reopen several shellfish beds in Dyes Inlet to harvesting in 2003.** The model was calibrated using data collected in the field, which involved a drogue study, current/flow monitoring, general water quality analysis, and a dye release study from the ESTP. The model shows that shellfish beds are not impacted during a CSO event.

14) Funding

The City has expended over \$50 Million dollars to complete the CSO Reduction program over the past 19 years. Outside sources of funds were obtained wherever possible, and included the following:

- 12 Public Works Trust Fund Loans totaling \$19,700,000,
- 20 State Revolving Fund Loans totaling \$13,900,000,
- 3 Centennial Grants totaling \$294,000,
- 4 State and Tribal Assistance Grants totaling \$7,200,000.

15) Compliance with Nine Minimum Controls

Compliance with the Nine Minimum Controls, required by the EPA CSO Policy, is determined by professional judgment of the NPDES control authority, the Department of Ecology. The City’s efforts to comply with these controls are described below.

PROPER OPERATION AND MAINTENANCE

The City’s WWTP has a written operations and maintenance manual and a computerized maintenance management program. Adequate funding is budgeted for these activities. An emergency response procedure is in place. The City is in compliance with the CMOM regulations.

MAXIMIZATION OF COLLECTION SYSTEM STORAGE

Collection system components are properly operated, maintained, and inspected to ensure adequate capacity and reliability. In 1996, the City started an on-going evaluation and optimization program that started when overflow weirs were raised to increase use of available storage in the collection system. The City inspects and maintains sewer lines to reduce flow obstructions and continually upgrades and optimizes lift stations to improve pumping capacities.

REVIEW OF PRETREATMENT REQUIREMENTS

Ecology administers the City's industrial pretreatment program. In 1996, Ecology finalized local limits for metals and coordinated the issuance of a waste discharge permit for the Puget Sound Naval Shipyard. PSNS is currently the only significant discharger identified by Ecology in the City's system. The City monitors and samples the influent flows from PSNS and in manholes in commercial areas to track non-domestic discharges.

MAXIMIZATION OF FLOW TO THE WWTP

The Bremerton Westside Wastewater Treatment Plant is able to process all of the wastewater it receives. The Westside WWTP received approval from Ecology and has been rerated to a maximum month capacity of 15.5 MGD during the wet season months (November – April) and 11.0 MGD during the dry season months (May – October). It has been implemented into the new 2013 NPDES Permit. Pump station reliability has been improved with the integration of new control systems, scheduled cleaning and maintenance of the wetwells, and systematic replacement of existing long shaft pump assemblies with close-coupled dry-pit submersibles. The initial replacement effort was on smaller stations, and the City has begun to replace pump assemblies in the larger stations.

ELIMINATION OF DRY WEATHER CSOs

Bremerton has no issues with dry weather CSOs. A few CSO locations also serve as emergency overflows for wastewater pump stations.

FLOATABLE CONTROL

No evidence exists to indicate issues with floatables from Bremerton CSO sites. The City has greatly improved catch basin and street cleaning activities over the past several years. All major City streets are swept every 6 to 10 weeks with special attention to commercial areas once each week. All City catch basins are cleaned annually.

POLLUTION PREVENTION PROGRAMS

The City, in addition to state and other local agencies, uses public education programs and materials to provide customer outreach on pollution prevention. Businesses are contacted through the ongoing cross connection and Stormwater IDDE (Illicit Discharge & Detection & Elimination) programs. Bremerton responds to reports of improper waste disposal into the storm and sanitary sewer systems and coordinates these activities with Ecology. The City has an active

grease trap and water conservation program. The above-mentioned catch basin and street cleaning program also reduce contaminants in CSOs and stormwater discharges.

Kitsap County has an effective pollution prevention program through the Solid Waste Division of the County Public Works Department and the Solid Waste Program at the Bremerton-Kitsap County Health District. Most residents and businesses are actively recycling. In 1996 the County opened its Moderate Risk Waste Facility to handle dangerous waste from homes and small generators. Bremerton is an active participant in the “West Sound Stormwater Outreach Group” (WSSOG), since 2001, that provides pollution prevention information through brochures, web page information, and newspaper ads. The purpose of the WSSOG is to work collaboratively to ensure compliance with the stormwater NPDES Phase II permit requirements targeting public outreach and involvement.

The WSSOG surveyed Kitsap Peninsula residents to generate a baseline of awareness and behaviors that will assist with the prioritization of outreach campaigns. The City and County both publicize hotline telephone numbers for public reporting of spills and other illicit discharges.

Bremerton maintains an internet website located at bremertonwa.gov that provides pollution prevention, CSO, and water conservation information to a wide variety of interested cities, organizations and people. In 2015 there were more than 70,000 visits from more than 25 different countries and various agencies.

PUBLIC NOTIFICATION

CSO discharge to marine waters is the main public health concern for shellfish harvesting. To meet the needs of the Washington State Department of Health & Shellfish program, a notification procedure was implemented in 2003 after several beds in Dyes Inlet were re-opened for harvesting. The Bremerton-Kitsap County Health District also posts these areas when a CSO event occurs. The City’s “Cooperative Approach to CSO Reduction” program educates residents through a multi-media approach using brochures and the web site, bremertonwa.gov that explains CSO’s with detailed animations.

MONITORING TO CHARACTERIZE CSO IMPACTS

CSO Water Quality Monitoring began in 1995 and ended in 2010. Samples were collected, analyzed and logged based on the water year, October to September. The City also coordinated monitoring efforts with the Navy ENVVEST project described above.

16) CSO/WW System Upgrades Planned for 2022

All capital improvements included in the CSO Reduction Plan and associated amendments have been constructed. The City continues to monitor system flows, and will consider additional system upgrades as the need arises.

Over the past several years, the City has been rehabilitated aging sewer infrastructure using cure-in-place-pipe (CIPP) technology. In 2021, the City lined approximately 6500 lineal of sanitary

and storm sewer piping in order to reduce inflow and infiltration into our sewer system. Approximately 9000 feet is scheduled for lining in 2022.

17) Eastside Plant Yearly Averages

Listed below are the yearly averages of TSS removal efficiencies and effluent settleable solids for the 2021 reporting period. This is a requirement of the NPDES Waste Discharge Permit.

| Eastside Plant Yearly Information | | | | | | | | | | |
|-----------------------------------|--------------|----------------------------|--------------|----------------------------|---------------|--------------|--------------|--------------|-------------|----------------|
| 2021 | | | | | | | | | | |
| Month | Influent TSS | Influent Settleable Solids | Effluent TSS | Effluent Settleable Solids | TSS % Removal | Influent BOD | Effluent BOD | Influent pH | Effluent pH | Fecal Coliform |
| 2-Jan | 143 | 8.00 | 4 | 0.10 | 97 | | | 6.87 | 6.97 | 19 |
| 4-Jan | 59 | 2.00 | 4 | 0.10 | 93 | 42 | 18 | 6.89 | 6.69 | |
| 5-Jan | 59 | 3.00 | 4 | 0.10 | 93 | 82 | 23 | 6.80 | 7.03 | 17 |
| 11-Jan | 65 | 1.00 | 22 | 0.10 | 66 | 101 | 14 | 435 | 6.63 | 10 |
| 1-Feb | 80 | 3.00 | 15 | 0.10 | 81 | 73 | 28 | 6.95 | 7.2 | 10 |
| 18-Sep | 120 | 11.00 | 32 | < 0.1 | 73 | 111 | 53 | 6.84 | 6.96 | 295 |
| 11-Dec | 90 | 2.00 | 8 | 0.10 | 91 | 67 | 20 | 7.31 | 7.15 | 10 |
| 18-Dec | 86 | 3 | 6 | 0.10 | 93 | 64 | 26 | 7.48 | 7.4 | 54 |
| Averages | 87.75 | 4.13 | 11.88 | 0.10 | 86.01 | 77.14 | 26.00 | 60.52 | 7.00 | 59.29 |


18) References

1. City of Bremerton CSO Plan, 1992, and Update, 2000
2. City of Bremerton Baselines Review and Recommendations, 1996
3. City of Bremerton Final Report: CSO Water Quality Characterization Study, 1997
4. EPA Guidance for Nine Minimum Controls, 1995
5. Washington Department of Ecology Guidance for Chapter 173-245 WAC, 1990
6. Puget Sound Naval Shipyard Project ENVVEST Technical Work Master Plan, May 2002
7. NOAA Atlas 2, Precipitation, Western United States, Volume IX, Washington
8. City of Bremerton Wastewater Comprehensive Plan Update, 2014

19) Certification

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signed by:


Eric J. Burris, WW Manager, City of Bremerton

5-10-22
Date